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10/696,131	10/28/2003	Kang-Bok Lee	3364P100	5527

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EXAMINER	
AGA, SORI A	
ART UNIT	**PAPER NUMBER**
2609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,131	LEE ET AL.	
	Examiner	Art Unit	
	Sori A. Aga	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _28 October 2003_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-12_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-12_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _10/18/2004_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _01/31/2005 and 10/28/2003_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. Claim1, 2,7,10 rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (herein after "Admission") in view of Kao et al (US 7,212,490) (herein after "Kao") and Cisco Port adaptor (herein after "Cisco").

Regarding Claim 1, where a ring selection method for node-to-node packet transmission in a dual ring network including a plurality of transmission nodes and reception nodes, Admission teaches that FIG. 4 is a flow chart of a ring selection method for dual ring networks according to prior art.

Regarding 1(a) where the method includes transmitting a reception node address request message for packet transmission to all the nodes, and updating a routing table using information on a short path transferred from the reception node; Admission teaches that the transmission node (420) broadcasts (to all nodes) an ARP Request (reception node address request message) (step S401-figure 4). Admission also shows the routing table is updated with information regarding the shortest path. (figure 4).

Regarding 1(b), where the method includes using information on inter-node hop numbers included in the routing table to select a ring having the lowest hop number between the reception nodes; Admission teaches "...the reception node selects a ring having the least hop number with reference to the topology map according to the ARP request message..." Admission also teaches a routing table (fig.7a) from which information is used in the route selection.

Regarding 1(c) and (d) where the method includes determining whether or not the ring is wrapped, Cisco teaches the step of determining how to discover whether a node is wrapped or not (page 8-10 –highlighted). It would have been obvious at the time of the invention to determine whether the ring is wrapped or not for fault recovery purposes. Admission does not explicitly teach the steps of comparing the ring's usage rate and hop number with reference values based on a ring selection algorithm, and if the selected ring is suitable for packet transmission based on the reference values, selecting the ring for packet transmission; However, Kao, in the same field of endeavor as Admission (dual ring topology networks) teaches "... A check is then made to determine if the congestion on the ring associated with the shortest path (path with fewest hop number) is greater than the congestion on the other ring. In one implementation, the congestion check is made by comparing a latency metric (reference value based on a ring selection algorithm) for a given node for each ring..." (column 9 lines 46-52). Therefore Kao teaches comparing the path with fewest hop numbers with reference values based on a ring selection algorithm (Latency metric). It would have been obvious to enable admission to include the step of comparing latency metric with the path with fewest numbers. This step is useful because "...When only path length is considered, added congestion can arise. For example, the traffic load might not be balanced between the two rings. As such, a packet added to a ring that is congested may take longer to traverse the shortest path than if the packet were placed on the other ring (i.e., transit time on the ring with less hop count may be longer than the transit time on the ring with less traffic)...." (column 2 lines 22-27).

Regarding 1 (d) where if the selected ring is suitable for packet transmission based on the reference values, the ring is selected for packet transmission; Kao teaches selecting the path depending on the comparison on step 358 of fig.3C. Therefore it would have been obvious to select the suitable ring for packet transmission in order to continue in forwarding the data to its destination.

Claims 2 and 10 All the limitations of claim 1 and 8 are included in claims 2 and 10 respectively. Regarding each of the transmission and reception nodes having a topology map including information on inter-node hope numbers, port information, MAC address, and wrapped-or-not information; admission teaches "...The prior art routing table (a) of node 1 presents the inter-node hop number and the hop number-based ring number...". However, admission does not explicitly teach that each node has a topology map including MAC address and wrapped-or-not information. However, Kao, in the same field of endeavor as admission (dual ring topology networks) teaches; "...an example of a topology table that includes topology information is given in fig.5. Each entry includes an address 502 (e.g., a MAC address) for a node (e.g., a destination node) discovered in the network..." (column 10 line 22-27). It would have been obvious to make admission's table include information on MAC address information in order to be used in making routing decisions for host packets. Regarding the topology map including wrapped or not information; admission does not explicitly teach that the topology map shows a wrapped or not information. However, Cisco, in the same field of endeavor as admission (ring networks) teaches "...Every node on a DPT ring maintains a topology map of the ring, so that it knows where to route traffic. It updates the topology map by periodically sending a

query, called a topology discovery packet, out onto the ring....when the discovery packet returns to the originating node, the contents of the packet are used to update the topology map..." (page 8). Cisco also shows the topology map includes information on wrapped-or-not status (page 10). Therefore, it would have been obvious to make the topology map show a wrapped or not information in order to enable nodes to know what data flow paths are available for transmission.

Claim 7, all the limitations of claim 1 are included in claim 7. Regarding the method of selecting the other ring when the selected ring is wrapped; examiner takes official notice that in selecting paths, the faulty line is avoided whenever possible. Therefore, when a wrapped ring is encountered in a dual ring topology, the only other available choice is selected.

2. Claim5,6 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Admission as applied to claim1 above, in view of Kao et al (US 7,212,490) as applied to claim1 above, and Cisco as applied to claim1 above and further in view of Doverspike et al (PG PUB 20020097671) (herein after "Doverspike").

Regarding claim 5, all the limitations of claim 3 are included in claim 5. However, Admission does not explicitly teach that the transmission coefficient is determined with reference to the hop number between the transmission node and the reception node, the usage rate of each node. However Kao teaches "...The method can include calculating a latency metric as the mathematical average of a previously calculated latency metric and an average transit delay for all nodes between the node and the given destination node.

The average transit delay can be weighted based on the number of hops between the node and the given destination node. The transit delay data can be a measure of the amount of traffic in a low priority queue of a given downstream node. …" (column 3 lines 58-63)…" Therefore, Kao teaches the transmission coefficient determined with reference to the number of hops and delay time. It would have been obvious to add transmission coefficient calculated with reference to the number of hops and delay time. This step is useful because "…When only path length is considered, added congestion can arise. For example, the traffic load might not be balanced between the two rings. As such, a packet added to a ring that is congested may take longer to traverse the shortest path than if the packet were placed on the other ring (i.e., transit time on the ring with less hop count may be longer than the transit time on the ring with less traffic)…." (column 2 lines 22-27). Regarding the transmission coefficient being determined with reference to the usage rate of each node, admission does not explicitly teach of a coefficient reference that is determined with reference to the usage rage of each node. However Doverspike teaches "…Weights (transmission coefficients) are computed for the links using an array representing a restoration link capacity--which is expressed as a number of channels …" (paragraph 6 lines 9-12). Doverspike further explains that the number of channels represents bandwidth needed for connection (paragraph 0018 – last sentence). This definition of 'number of channels' is substantially the same as that of given in the present invention's specification (i.e. maximum Bandwidth available to the corresponding node). Therefore, Doverspike teaches that the weigh (transmission coefficient is computed based on usage rate (number of channels available). It would have been obvious to include

usage rate (number of channels available) in Kao's latency metric in order to properly balance load between the available links.

Regarding claim 6 and 12, where the usage rate and the transmission coefficient are calculated in a predetermined cycle, and updated in the routing table; Doverspike teaches "..., pre-computed restoration paths may be stored at the endpoint nodes of the connection and utilized, upon a network failure, to reroute the service connection..." (paragraph 0018 lines 14-17). Therefore, it is inherent that in order for the paths to be pre-computed and stored, the table used for the computation is updated before the computation is made. Doverspike also teaches that the pre-computation can be made during the setup of the connection. Therefore it would have been obvious to calculate the usage rate and transmission coefficient in a predetermined cycle. A predetermined path increases performance with respect to data transmission rate since the computation won't have to be made while a data that is ready for transmission is put on hold until the computation is made. The decision on the path is already made and therefore the system is ready and standing by to forward data packets.

3. Claims 3,8,9,11 rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al (US 7,212,490) (herein after Kao) in view of (Doverspike et al) (PG PUB 20020097671) (herein after "Doverspike")

Regarding claim 8, where a method for selecting a rig for transmitting packets in a dual ring network if neither ring is wrapped; Kao teaches "...A method and apparatus for

servicing transmit traffic in a node of a network where the network includes a plurality of nodes connected by first and second rings formed by two or more transmission media…" (abstract lines 1-4)

Regarding step (a) where a transmission coefficient for each ring based on for each node in each ring, a hop number, a usage rate and a delay time is calculated, Kao teaches calculating a latency metric (transmission coefficient) based on delay time and number of hops. Kao teaches "…The method can include calculating a latency metric as the mathematical average of a previously calculated latency metric and an average transit delay for all nodes between the node and the given destination node. The average transit delay can be weighted based on the number of hops between the node and the given destination node. The transit delay data can be a measure of the amount of traffic in a low priority queue of a given downstream node. …" (column 3 lines 58-63). Regarding usage rate being used in calculating the transmission coefficient, Kao does not explicitly teach that the transmission coefficient is calculated based on usage rate. However, Doverspike teaches "…Weights (transmission coefficients) are computed for the links using an array representing a restoration link capacity--which is expressed as a number of channels …" (paragraph 6 lines 9-12). Doverspike further explains that the number of channels represents bandwidth needed for connection (paragraph 0018 – last sentence). This definition of 'number of channels' is substantially the same as that of given in the present invention's specification (i.e. maximum Bandwidth available to the corresponding node). Therefore, Doverspike teaches that the weigh (transmission coefficient is computed based on usage rate (number of channels available). It would have been obvious to include

usage rate (number of channels available) in Kao's latency metric in order to properly balance load between the available links.

Regarding step (b) where the ring with the lowest calculated transmission coefficient for transmitting packets is selected; Kao does not explicitly teach that the ring with lowest calculated transmission coefficient for transmitting packets is selected. However, Doverspike teaches "... a path with smaller total weight (transmission coefficient) is typically preferable..." (paragraph 0031 lines 3-4). Therefore, it would have been obvious to select the path (ring) with the smaller transmission coefficient (weight) in order to minimize the "cost" to the network.

Regarding claim 3, said references teach the method of calculating a transmission coefficient using the hop number and delay time based on a path between the reception nodes, and inter-node usage rate as discussed regarding claim 8.

Regarding storing the calculated transmission coefficient in the routing table Kao teaches "...in one implementation, the information gathered is stored in a topology table and used in making routing decisions ..." (column 10 lines 21-23). Therefore it would have been obvious to add the transmission coefficient in the table since it is used in making routing decisions.

Regarding the method of selecting a ring having lower transmission coefficient stored in the routing tale as the reference value, said references teach selecting the path (ring) with the fewest transmission coefficient value, as discussed regarding claim 8. Motivation to combine provided in said discussion.

Claim 9, all the limitations of claim 8 are included in claim 9. Regarding the hop number and usage rate being determined with reference to values in a routing table; Kao teaches "...in one implementation, the information gathered is stored in a topology table and used in making routing decisions ..." (column 10 lines 21-23). He also teaches that hop number is included in the topology table (routing table) of fig. 5 (fig 5). Therefore, Kao anticipates that hop number is determined with reference to the value entered in the table. However, Kao does not explicitly teach usage rate. However, Doverspike teaches usage rates as variables for the determination of transmission coefficient. Since Kao teaches information gathered is included in the table to be used in making routing decisions, it would have been obvious for a person who is skilled in the art to include the usage rate data in the table in order to keep an organized and updated data that is gathered from the topology discovery packets.

Claim 11, Regarding calculating a transmission coefficient for each of the nodes, Kao teaches "...process 300 is implemented in each node of network 201..." (column 9 lines 29-31). And process 300 (as shown in figure 3a) includes calculating transit delay vectors (part of the latency metric i.e. transmission coefficient).

Regarding the step of storing the calculated transmission coefficient in a routing table, Kao teaches that information gathered is included in the table to be used in making routing decisions as discussed above regarding claim 9.

Regarding the step of selecting a ring having a lowest transmission coefficient stored in the routing table. Kao does not explicitly teach selecting a ring having a lowest transmission coefficient stored in the routing table. However Doverspike teaches

selecting path (ring) with the lowest transmission coefficient as discussed above regarding claim 8 step (b). Therefore it would have been obvious for a person who is skilled in the art to select the path with the lowest transmission coefficient for the same reason as discussed in said discussion.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim4 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

All the limitations of claim 1 are included in claim 4. Claim 4 further comprises the method of "Determining whether or not the selected ring and the ring selected by the ring selection algorithm are matched to the reference values". Examiner is unable to either find explanation to further clarify the limitation "matched to the reference value" in the specification or reasonably construe said disclosure as one of ordinary skill in the art would.

Examiner is unable to examine the claim further on the merits.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sori A. Aga whose telephone number is (571) 270-1868. The examiner can normally be reached on M-Th 7:30-5:00, F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on (571) 270-1868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S.A.

CHARLES D. GARBER
SUPERVISORY PATENT EXAMINER